

Notes to accompany a folio of Musical Compositions

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*for Justine,
for never asking why*

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Introduction

The folio of compositions submitted here consists of the six large-scale works that I have completed between the years 1994 and 2003. Over the course of this nine-year period I hope that the folio demonstrates a consistent and constantly evolving thread of techniques and processes in spite of the substantial developments in my overall compositional style, intentions and interests.

The works make use of a wide and unconventional range of source materials and instrumental combinations indicative of the numerous and diverse musical styles and genres with which I have been involved over the last nine years as a pianist, percussionist, part-time lecturer and teacher.

During my undergraduate degree the two areas of study that were to have the most profound influence on my compositional methodology were those of minimalism and serialism.

In addition, the New Music Ensemble performed a number of seminal works by Steve Reich, including *Tehillim* and *Music for Large Ensemble* and I became fascinated by his use of prolonged repetition and the infinite compositional possibilities presented by the various processes such as augmentation, phase shifting and rhythmic construction¹.

The original concepts of total or integral serialism, a method allowing predetermined formulae to control and manipulate the majority or all of the compositional elements,

now operate on a macro level, providing a structure and framework in which the intricate minimalist devices have the freedom to expand and develop within an organic environment.

Compositions

by air, sea & land (1995)

for two pianos

As the first piece in the folio, *by air, sea & land* describes various experiences and incidents that occurred during an ill-fated holiday on the Greek island of Kefelonia and remains the only non-abstract composition I have ever written. As the title suggests, the work is divided into three distinct movements.

by air encapsulates the excitement of take off in the exposition (Bars 1-11), the initially static low register material, representing the monotony of a long flight, is fragmented and transformed as landing approaches by constant changes of gesture, register, texture and meter.

by sea, in contrast, occupies a very different soundscape. The second piano sounds an incessant and irregular three note sequence over which a single line is coloured and decorated, rising and falling in wave like shapes.

by land is a moped ride. The relentless and repetitive semiquaver motives give a feeling of rapid movement and adrenalin around sharp bends and steep inclines. The three cluster chords in Bars 203-204 signal the end of the journey and the following twenty bars the shock, confusion and disorientation after the crash.

The main technical aim of the piece is the gradual development and integration of three

disparate musical elements/objects into a single homogenous and repetitive whole.

The first element is the tremolando figure that dominates the introductory bars and is used constantly throughout the first movement to portray the feeling of motion.

The second element is represented by the omnipresent conflict between the lowest two notes on the piano (A1 and B flat1) out of which grow a number of subsidiary melodic gestures that move into higher registers and combine with other objects as the process begins again beneath them.

The third element initially appears as an explosive single line melodic figure (Bars 22-23) and is continually coloured and developed throughout the piece, finally evolving into the principal compositional thread (Bar 160 onwards) of the last movement.

by air, sea and land was selected for the SPMN season shortlist 1995-1996

journey (1995)

for wind ensemble and amplified string section

The piece takes its title for two reasons. Firstly, the basic structure of the piece is a journey through the seventy-two melakavta (scale types) of Carnatic music theory, providing a constantly shifting harmonic background. Secondly, and somewhat ironically, the seventy-two chords are rooted to a single harmonically important note for each of the three individual sections, in a sense negating the sensation of movement in favour of stasis.

As the second piece in the folio, *journey* develops many of the principles and devices used in *by air, sea & land*, but whereas the previous work combined a number of disparate musical elements and gestures to create a single linear object, *journey* is the first to experiment with the use of multiple layers running concurrently to produce the effect of conflict and, ultimately, resolution.

The primary stratum is constructed of six individual parts, played by the upper strings, that undergo a process of simultaneous rhythmic diminution, motivic decoration and phase shifting and arrive at the second section as a unison chord in synchronisation with the second stratum. The rhythmic unison is upheld throughout the middle movement and subjected to a process of deconstruction in the third.

The second layer itself starts in Bar 7 as a single melodic line and is subjected to a number of developmental processes as the movement unfolds, such as thickening with

auxiliary unison lines and the interjection of the two and three note oscillation figure derived from the opposing stratum. The thread continues to dominate the rest of the piece allowing melodic fragments and later, resonant material to emanate from it.

journey was performed by the Birmingham University New Music Ensemble in June 1996. In March of the next year the score was reworked for a workshop by the BCMG and a number of necessary instrumental and compositional revisions were made. The first version is submitted for reference as Appendix I.

xpianos (1998)

for six pianos

xpianos is a landmark work in my folio of compositions. The expansive and complex soundscapes of the first two pieces were banished in a piece in which the concepts of slow melodic and harmonic development and a multitude of minimalist rhythmic devices ruled under the banner of sustained repetition and unrelenting pulse.

The choice of such a homogenous ensemble demonstrates a desire to divorce myself from the complexities of timbre associated with a mixed ensemble, where process and texture can be explored in a neutral environment and equal authority and weight can be placed on each line of material. The *x* in the title simply represents the way in which the ensemble inexorably grew in size: *x* at that time being the unknown quantity. The ensemble also pays homage to a composer and a piece (Steve Reich, *Six Pianos 1975*) that I feel have been extremely influential upon my musical sensibilities and compositional style.

I also wanted *xpianos* to have strong elements of consolidation, so that it could make reference to and develop certain compositional techniques used in *by air, sea & land* (1995) and *journey* (1996), in addition to exploring new devices and processes of its own. The references take place in a number of ways.

Formally *xpianos* is once again through-composed although it comprises six distinctly identifiable sections. Whereas *journey* was the first piece to have a rhythm template governing elements such as pitches, entries and phrase lengths in its first movement,

each section of *xpianos* contains multiple templates and pseudo pulse modulations. These templates help to define the shape, length, texture and character of each section in a process I have labelled *phase construction*. Typically this involves locating a unison point at the end of a movement or at a climax point and working backwards, moving the individual lines increasingly out of phase. When played forwards the lines seem to be gradually assembling themselves into a whole. With these patterns used as a basic template, additional minimalist rhythmic/melodic devices, such as small cycling cells and additive processes, are superimposed on top to create the detailed foreground.

The principal compositional aim of *xpianos* was to place two contrasting strata (a harmonically static structure rooted to a single chord per section and an expanding six part fugue like object) in the same region of the piano and explore ways in which they can work together within the resulting texture.

The removal of all semitone “clashes” throughout the entire work had two important side effects. Firstly, a wide-open, whole tone environment was created and, secondly, the destructive act of actually removing those notes and clashes created rhythmic interest from previously continuous semiquaver passages.

drum no bass (2003)

for 13 percussionists

In *drum no bass* I wanted to create a substantial, large scale work for percussion ensemble and, in doing so, further expand and develop a number of rhythmic devices and methods used in *by air, sea & land* (1995) and *xpianos* (1998).

The title is intended to be both an indicator to the listener, providing an idea of the main component of the work, and a slightly childish pun. The only source material is a four bar drum kit loop taken from the album *Timeless*² by Goldie, who is widely considered to be one of the leading exponents of the drum n' bass genre in the UK.



The source material itself gave me three distinct compositional elements: hi hat, snare and bass drum, which would provide the primary conflict within the work of metal versus skin, reflected both in the choice of instrumentation and stage positioning.

The finished piece is the result of the confrontation and interaction of a number of different strata, each realized from the four bar pattern and each working through different rhythmic processes at various tempi and levels of importance. The primary level, or foreground, is the interaction of a number of solo lines, constructed from two and three note fragments of the loop and played by the six soloists.

The main subsidiary stratum consists of a sequence of consecutively ordered loop fragments superimposed on to the foreground detail creating a number of snare, bass and cymbal accents that metrically modulate their tempi to be in synchronisation with the former at the beginning of the third movement (Bar 163)

The second section (Bar 124), consisting of fifteen wave like structures, will inevitably bear comparison to the unison quintuplet passages in *Ionisation*. It was my intention to solve the accuracy problems that occur when playing patterns across a pulse that is unevenly subdivided with the use of a heavily damped practice pad. The percussionists are able to play continuous quintuplet and sextuplet semiquavers in virtual silence whilst sounding the notes with greater authority and accuracy.

As it is vital that the tempo does not fluctuate during performance (tempo changes are achieved through pseudo metric modulation³) I have produced a seven-part click track for the six soloists and conductor, sounding the pulse and individual subdivisions for each player.

drum no bass has been a work in progress since 1999 and was finally completed in the summer of 2003.

journey's end (2003)

for orchestra

journey's end is by far the longest piece in the folio and tackles the issues and problems associated with superimposing and sustaining the rhythmic and melodic processes that had evolved previously on to a large scale orchestral work.

The initial solution was to assign each instrumental group a specific role or set of characteristics to explore throughout the piece. The woodwind and brass sections were designated as the two main protagonists, with the strings and percussion taking a more subsidiary/commentary role. The wind material embraces a duplet and triplet argument and polyphonic melodic phrases that make minimum use of motivic repetition. The brass instruments present material in a unison duplet meter, reintroduce the demi-semiquaver figure that appears in the introduction and displace their entries in accordance within a pattern of middle, low and high.

The role of the string section is predominantly that of commentary, primarily providing colour and resonance but, as the piece progresses, the diversity of material increases as it takes on certain rhythmic and melodic characteristics from the other instrumental groups.

The piece takes its title not only from the desire to draw together all the varied compositional threads and ideas encapsulating my nine year odyssey but also from the fact that the structural plan and source material were reclaimed from a single section of *journey* (1995). The first movement of *journey* provided a structural plan and size ratios

for the thirty-two through composed sections of the new piece, to which was added a sequence of key notes and an indication of which instrumental group would dominate in each movement and therefore impose their own characteristics upon the rest of the ensemble.

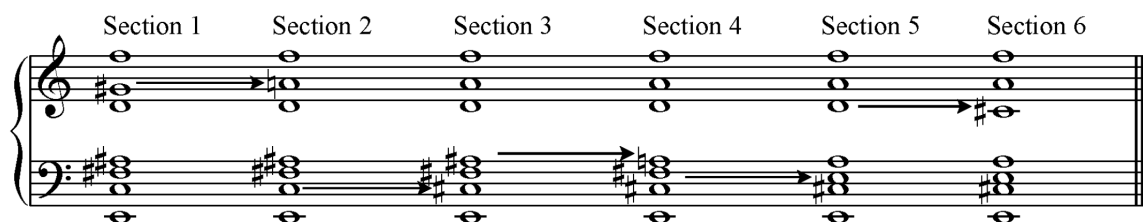
The outer two movements reveal the main compositional aim of the piece. The majority of rhythmic devices, structural templates and tempo markings are endeavouring constantly to push the work forward, resulting in the coda (bars 690-720) being twice the speed of the introduction. At a micro level, each instrumental group contributes to this process by absorbing and developing certain rhythmically progressive elements and characteristics from the other groups. In spite of being the source and catalyst for all the rhythmic activity in *journey's end*, the percussion section is not involved in the diminution process and therefore provides the only constant throughout the piece.

Compositional Techniques

Raw material

To the listener the most obvious layer of compositional activity and development in all of the works in the folio would be the highly repetitive and linear motivic patterns that create the foreground interest or detail. In order to locate and organise these multiple strands of linear material, I create/make use of a predetermined framework or sequence of scales, arranged vertically, to produce constant and subtle variations in the harmonic background.

I have devised and used three distinct scale sequences. The first comprises every possible combination of tones and semitones within a seven-note scale and is used exclusively to produce the harmonic framework and structure for *by air, sea and land*. The second is a pattern of seventy-two seven-note melakavta (scale types) which are cycled through in strict numerical order in both the first movement of *journey* and over the entire length of *journey's end*. The third pattern takes the final scale of the former sequence as its starting point and, through a progression of rising and falling tones and semitones, transforms the predominantly whole tone scale into the concluding A major chord (with the added “key” note F.)



The individual notes of a chord are vertically organised both symmetrically and, more frequently, in harmonic order. The latter provides the opportunity, for example, to impose a predetermined pattern or cycle of key root notes on to an unrelated sequence of chords or to double certain harmonically or structurally important notes in order drastically to change the colour and character of vertical material.

The horizontal/linear detail is generated in a variety of ways. If the overall aim of the piece is that of conflict and resolution, then the melodic material would be derived from a different source from that of the harmonic elements. In *by air, sea and land* a twelve-tone row is used for the first and only time, in contrast with the seven-note scales that produced the harmonic material. The row itself can be divided into two distinctive and contrasting halves, the first being sequential and uplifting in character, the second, dominated by the intervals of a semitone and augmented 4th, is darker and more sinister in nature.



The P-0 and I-0 versions of the scale are subjected to the process of transposing the row in rotation, by which the root note is superimposed on to the second note of the row creating a variation with the same but displaced intervallic properties of the original. By taking this process to its natural conclusion, it is possible to create twenty-four related variations of the original row, each with twelve chromatic transpositions and retrograde versions. The detail is then constructed of a row or segment chosen as a result of its intervallic qualities, how it relates to the harmonic background or simply to extend the line by dovetailing with the previous row fragment.

Threads

I first experimented with the process of composing around a single line⁴ in a piece entitled *Broken Threads*, submitted as part of my MA folio in 1994. The opening movement consisted of a single line that was spread across the ensemble in minute fragments, each fragment eventually evolving into a complete line of material and therefore changing the original disparate strand into a dense and complex unison texture.

The first movement of *by air, sea & land* deals primarily with the conflict and eventual integration of three elements; however the subsequent sections are almost entirely constructed around a continuous melodic strand. The thread in *by sea* starts at bar 98 and is predominantly constructed of a series of harmonically ordered chords, presented as a single melodic line, constantly trying to move away from the root note (initially the C sharp.)

The thread is coloured and developed in a number of ways. Firstly, six chords (also defining the six subsections of *by sea*) are sounded against the line and held by the sostenuto pedal. These notes are increasingly played and sustained as the thread develops, providing the initial and constant harmonic landscape.

Secondly, key notes are doubled in upper registers (typically one or two octaves above), adding higher frequency resonance to the line and melodic importance to those notes that derive from a transposition of the second half of P-0.

P-5 (notes 7-12) A, Bb, Gb, C, B and Eb

Thirdly, unrelated and disparate horizontal interjections, originating from the various transpositions of the row in rotation, are added in order to distance the thread from its stable and comfortable harmonic beginnings. These melodic fragments are then grouped vertically and used as markers to add three to eight note chords that are to be heard subsequently in section three.

Finally a second, more static and repetitive line is added (bar 129), disregarding the highly decorative and complex character of the thread at this stage and hinting at being both a recapitulation of the original line (bar 98) and a reference to the third movement.

The technique of widening a thread by adding subsidiary lines is developed further in the first and second sections of *journey (1995)*. The single strand that appears in bar 6 is thickened in bar 20 with the addition of a bass clarinet line appearing in unison rhythm but possessing non-identical melodic phrase lengths. By bar 54 there are six lines in operation, however in contrast to *Broken Threads* (MA 1994), they are subsequently fragmented and dispersed around the ensemble in order to create an unsettled and constantly evolving texture.

The concept of using multiple lines constructed of incessant and repetitive short melodic phrases, so prevalent in later works such as *xpianos* and *journey's end*, was firstly conceived in the final section of *by air, sea, & land* (bars 160-231). The two melodic strands - now in unison meter, continuous semiquavers and identical phrase structures - travel through a complex sequence of three, four, five and six note patterns and are

augmented with the addition of up to two more fragmentary subsidiary lines to provide the vertical extremes for the chords in the first piano part.

Conflict & layers

The use of strata, and the subsequent conflict generated, has been one of the defining techniques of my compositional methodology. My initial use of several layers or elements to create a dense and complex texture occurred in the first movement of *journey* (1995). The three independent and disparate elements (the thread, the harmonic background and the brass chords that metrically accelerate against the tempo of the piece) arrive in rhythmic synchronisation at the beginning of the second section; however they do not attempt to absorb any characteristics of the other layers in order to resolve the texture convincingly into a homogeneous whole.

I therefore attempted to address this problem during the realization of *xpianos*. The most important factors in allowing the two contrasting strata to interact successfully and eventually to bond together as one unit were those of relative size, instrumentation and register. The six note structuring chords (one per section), although decorated with numerous small melodic phrases, are static and therefore provide a rigid and unchanging background to each movement. The thread is constructed initially from P-0 (F, A, B, G#, A#, F# & G), which is fragmented to form four to six individual lines, each rising and falling in tone and semitone intervallic steps. In contrast with the structuring chords, the thread lines are not subjected to melodic decoration until the second movement (bars 49-105), a plan of which is included for reference as Appendix II (the thread detail is not represented as it develops independently). It is clear that the different strata gradually

expand and contract but conversely share the same pitch region creating a sense of conflict and argument which results in a blurring of specific identities.

By the final section (bars 273-356) the sequence of structuring chords, which has already reached its conclusion by the opening of the movement, is once again sounding just two lines of oscillating intervals and serving as a direct recapitulation of the first movement. In this instance the development is restricted to only two and three note patterns, as if to demonstrate a desire not to move too far from the key note. The thread moves gradually and inexorably towards the structure chord and the resolution is seemingly completed in bar 347 although, as a final twist, the two strata are displaced by a semiquaver and therefore fail to achieve true rhythmic unison.

The concept of conflict and resolution is further developed in *journey's end* by assigning each instrumental section a specific set of characteristics and compositional elements (discussed in detail on page 11). The twenty-one movements were each allotted a dominant instrumental group that would impose its own characteristics, such as gesture, shape, texture and rhythm, on the rest of the ensemble. The subsidiary groups are consequently obliged either to absorb those stylistic elements into their own material as they perform a commentary role or to ignore the main instrumental group in favour of creating their own independent and conflicting stratum.

By the eighteenth section (bars 496-544) the brass, woodwind and string sections, although they are highly evolved and have absorbed many of each other's stylistic qualities, are working on three distinctly separate strata. The pianos and the overall

structural shape are, at this stage, the only unifying features present within the dense and elaborate texture. The two subsequent sections provide a simple and understated recapitulation of the main source material and initial concepts prior to the resumption of the entire process in the final section (bars 587-689).

The instrumental groups now begin to recognize and acknowledge important events and objects occurring concurrently in the competing strata. In contrast to the previous substantial section (bars 496-544), a rhythmic construction template is employed to ensure that the three disparate strands arrive at the end of the section in perfect unison. The strands, at this instant locked into identical phrase lengths and refusing to relinquish their individual motivic identities, are diluted and diminished throughout the coda into a single and homogeneous object.

Rhythm

The procedures used in the generation of structure and rhythm throughout the folio, although highly personal and unique to those pieces, are similar to those used by other minimalist composers. The rhythmical processes can be broken down into a number of distinct stages or levels, as illustrated in the flow chart overleaf (figure 1).

As rhythmic construction and structural shape are the most important aspects of the majority of the pieces, the rhythmic source material is predominantly the starting point for each work.

As is the case with *xpianos*, the source may not include any detail or specific idea, but simply the concept of two disparate, competing strata and how they evolve throughout the work, and consequently suggesting movement shape and structure. Therefore, in the absence of any detailed source material to work with, the large-scale structure of the piece may take priority at this early stage.

In contrast, the source may include some motivic detail, such as a phrase or pattern that can produce the rhythmic and structural content for the whole piece, as demonstrated in the two later works; *drum no bass* and *journey's end*. The entire rhythmic content of the latter is organically developed from a short eight-note pattern, appearing in the brass in section 1 (bars 47-51) in its original form and constructed from two rhythmic elements from the Rhythm Sheet⁶ (submitted for reference as Appendix III). The two elements are gradually augmented and developed by firstly substituting longer five and six note

phrases and subsequently by inserting additional elements in order to increase the overall pattern length to a maximum of thirty-five by the end of the exposition (bar 231). The resulting rhythmic thread is prevalent throughout the piece and, although the overall section structure and positioning has been predetermined, individual section length is governed by the processes and techniques imposed on the thread itself.

Once the overall structural ratios, shapes and objectives have been finalised (in reference to non-organically structured pieces such as *xpianos* and *drum no bass*) the next level of rhythmic construction can take place involving the creation of a framework or map for each movement, on to which the rhythmic and melodic detail is positioned.

The initial use of a prearranged framework took place in the first movement of *journey*. The six lines that form the harmonic background arrive at the end of the first movement sounding a pattern of three dotted semiquavers in unison. Immediately proceeding this event, the individual strands are allocated an independent rhythm value or “change note”, the length of each varying in increments of a demisemiquaver, in order to break up the patterning. As this process is continually repeated and the three note patterns gradually cycle through longer note values, the once unison framework is drastically displaced. Working forwards, the material at first appears as unrelated strands but as the movement progresses, they audibly begin to assemble into a whole.

The simplest and most effective use of a map or framework occurs in the first movement of *xpianos*. In this instance there are only the two levels of activity; however each layer has a strong controlling influence over the other. The four-part thread is derived from a

predetermined rhythmic map in which the lines begin to assemble, arriving at the end of the section in perfect unison. The static harmonic structure, initially only a two-note oscillation, expands to form a gradually evolving palette of two, three, four and five note motives. The number of repetitions and individual phrase lengths are randomly generated using the Rhythm Sheet (Appendix III) and the patterns are once again constructed in reverse to achieve a unison of strata at the end of the movement. The melodic activity within the thread is triggered each time the palette of phrase lengths is increased or contracts at the beginning of a cycle; however, the actual number of phrase repetitions and the overall length of the section is dictated by the thread itself.

By the time we reach section five (bars 149-272) the rhythmic framework is far more complex. The two strata are gradually moving towards a single unison event at rehearsal letter J, although a true unison will not exist as the phrase lengths of each layer are not identical. In order to create a contrast in texture, an additive process is superimposed on to the framework. The Rhythm Sheet determines which of the individual motivic cells are to be active and, on a micro level, how many notes are played in that cell, and therefore the overall level of activity is increased as the climax approaches.

A similar framework of phase construction was subsequently devised for the first movement of *drum no bass*, once again ending in a sequence of three unison crotchets. The map was then examined to locate any examples of at least three consecutive cells that were of equal length and that occurred in unison with those cells in surrounding patterns. These fragments were designated as the solo or main lines and were decorated in a number of ways. The individual cells were assigned a bass, snare or cymbal (hi-hat)

accent to punctuate the texture and provide a continuous and augmented version of the complete four bar source material. In addition, if other blocks were to coincide with the accent pattern then they would perform a sympathetic, commentary role adding colour and interest to the solo material.

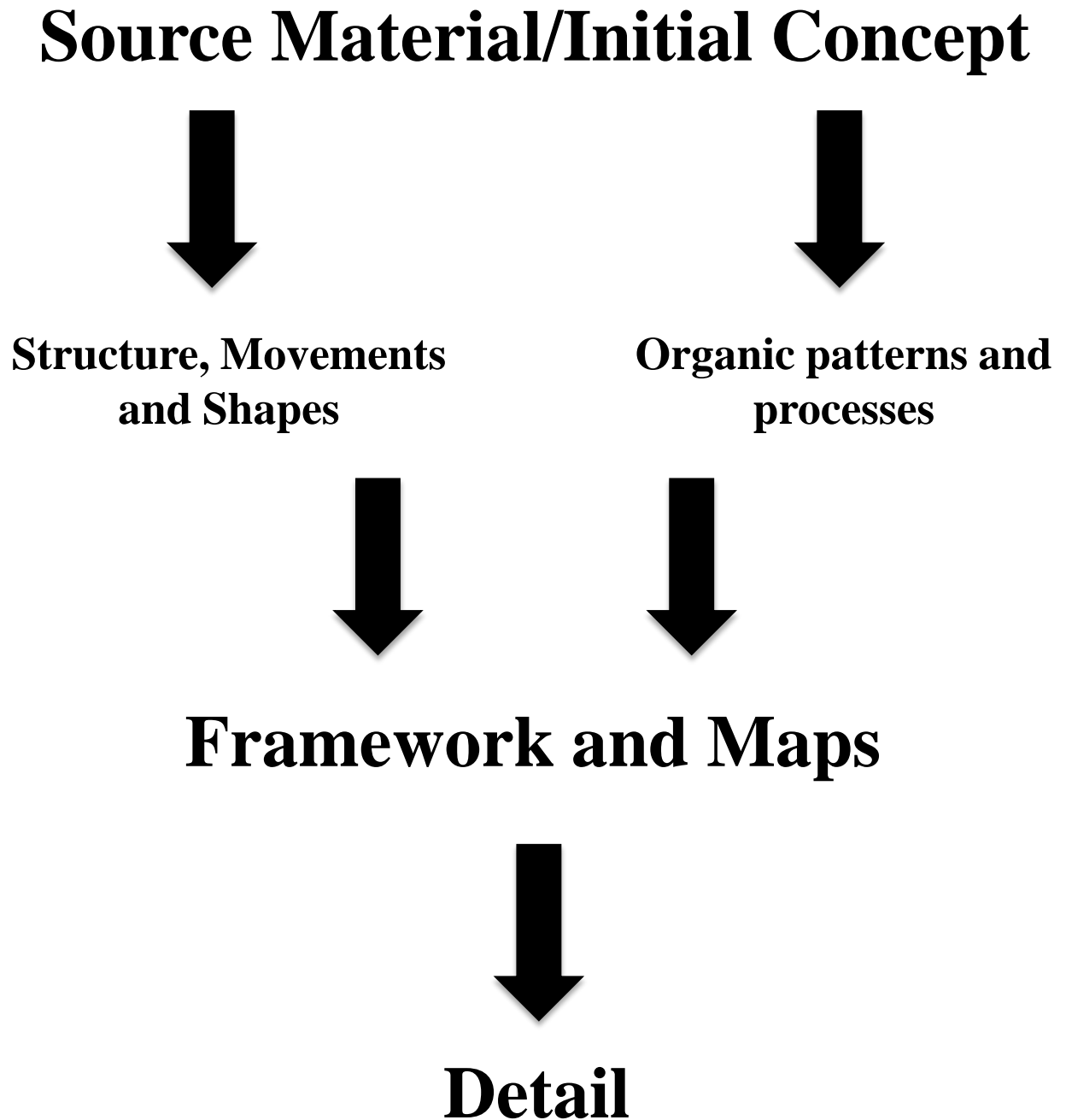
As a result of the diminishing nature of the framework, the accents appear to accelerate against the foreground material and the authentic pulse of the piece. This process of pseudo metric modulation is further expanded in the second movement. The various meters used in the previous section now form a continuous series of fifteen wave-like structures. The accent patterns use the different meters to accelerate gradually through the section and therefore commence the final movement in the quaver meter of the source material - and furthermore provide the only complete performance of the original four bar riff.

The concept of pseudo metric modulation is prevalent in all the works in the folio; however, *drum no bass* is the only piece to use this process as its primary compositional element.

The final aspect of rhythmic construction is the creation of the detail or foreground material. In *drum no bass* the solo lines are firstly allotted a pattern of various meters (crotchet subdivisions), the palette of which is widened as the movement unfolds. The four bar riff is consequently divided into all the possible two- and three-note combinations and superimposed on to the meter plan in a sequence derived from the Rhythm Sheet. The choice of fragments, arranged in ascending order of rhythmic

complexity and assigned to different percussion instrument “pools”, can be restricted and manipulated to maintain a degree of control over the character and shape of the foreground material.

Figure 1
Rhythmic Construction



Notes

1. Mertens (1993), page 58. The technique of substituting beats of rests, gradually building up the basic rhythmic pattern.
2. Track 2, *Saint Angel*, counter reading 00'24"
3. Pseudo, as the works do not use the process to modulate metrically to a new tempo.
4. Klee (1968), page 16
5. The Rhythm Sheet (Appendix III) is a palette of every possible combination of beat and rest within 3,4,5 and 6 note patterns. It is systematically used to control various compositional processes and elements such as phrase lengths and repetition, motivic patterning and actual rhythmic detail.

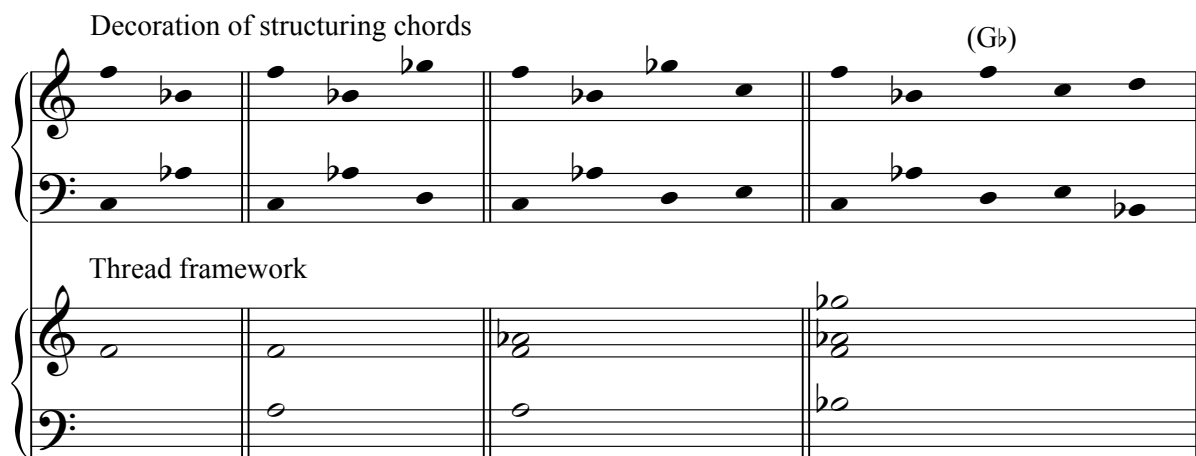
Appendix II

xpianos/section 2

Decoration of structuring chords

(G \flat)

Thread framework



5



9

(A \flat) (A \flat) (A \flat)

(E) (E)



Appendix III

Rhythm Sheet

The rhythm sheet consists of ten staves, each containing a series of rhythmic patterns. The patterns are labeled with numbers and letters, indicating specific rhythmic exercises or variations. The notation includes eighth notes, quarter notes, and rests, with some patterns featuring beams connecting multiple notes.

Staff 1: 33a, 32a, 32b, 32c, 31a, 31b, 31c, 44a, 43a

Staff 2: 10, 43b, 43c, 43d, 42a, 42b, 42c, 42d, 42e

Staff 3: 18, 42f, 41a, 41b, 41c, 41d, 55a, 54a

Staff 4: 25, 54b, 54c, 54d, 54e, 53a, 53b

Staff 5: 31, 53c, 53d, 53e, 53f, 53g, 53h

Staff 6: 37, 53i, 53j, 52a, 52b, 52c, 52d

Staff 7: 43, 52e, 52f, 52g, 52h, 52i, 52j

Staff 8: 49, 51a, 51b, 51c, 51d, 51e, 66a

Staff 9: 55, 65a, 65b, 65c, 65d, 65e

Staff 10: 60, 65f, 64a, 64b, 64c, 64d

Staff 11: 65, 64e, 64f, 64g, 64h, 64i

70 64j 64k 64l 64m 64n

75 64o 63a 63b 63c 63d

80 63e 63f 63g 63h 63i

85 63j 63k 63l 63m 63n

90 63o 63p 63q 63r 63s

95 63t 62a 62b 62c 62d

100 62e 62f 62g 62h 62i

105 62j 62k 62l 62m 62n

110 62o 61a 61b 61c 61d

115 61e 61f

Bibliography

Adler, Samuel. *The study of orchestration* (Norton 1989)
Brindle, Reginald Smith. *Serial Composition* (Oxford University Press 1966)
Cross, Jonathan. *Harrison Birtwistle* (Faber 2000)
Griffiths, Paul. *Gyorgy Ligeti* (Robson Books Ltd 1997)
Haimo, Ethan. *Schoenberg's Serial Odyssey* (Oxford University Press 1992)
Kennan and Grantham. *The Technique of Orchestration* (Prentice Hall 1997)
Klee, Paul. *Pedagogical Sketchbook* (Faber 1968)
Mertens, Wim. *American Minimal Music* (Kahn & Averill, London 1983)
Reich, Steve. *Writings on Music, 1965-2000* (Oxford University Press 2002)
Osmond-Smith, David. *Berio* (Oxford University Press 1992)
Kennan and Grantham. *The Technique of Orchestration* (Prentice Hall 1997)
Ulehla, Ludmila. *Contemporary Harmony* (Advance Music 1994)

Scores and Recordings

Adams, John. *Harmonielehre* (Associated Music Publishers 1995)
(CBSO/Rattle/EMI 1994)
Ades, Thomas. *Asyla* (Faber 1999)
(CBSO/Rattle/EMI 1999)
Andriessen, Louis. *Hout* (Boosey & Hawkes 1991)
Andriessen, Louis. *De Staat* (Boosey & Hawkes 1976)
Berio, Luciano. 'Points on the curve to find...' (Universal Edition 1974)
Birtwistle, Harrison. *Carmen Arcadiae Mechanicae Perpetuum* (Universal Edition 1981)
Hoyland, Vic. *the other side of the air* (Universal Edition 1992)
Reich, Steve. *Six Pianos* (Boosey & Hawkes 1973)
Reich, Steve. *Music for Large Ensemble* (Boosey & Hawkes 1978)
Reich, Steve. *Drumming* (Boosey & Hawkes 1970-71)
Reich, Steve. *Tehillim* (ECM 1992)
Stavinsky, Igor. *The Rite of Spring* (Boosey & Hawkes 1921)
Turnage, Mark-Anthony. *Your Rockaby* (Schott & Co. Ltd London 1995)
(BBC Symphony/Davis/Argo 1996)
Varese, Edgard. *Ionisation* (New York Phil/Boulez/Sony 1990)

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